**PROJECT NUMBER:** 4009
**PROJECT TITLE:** Smoke Studies
**PROJECT LEADER:** B. L. Goodman
**PERIOD COVERED:** June, 1988

PROJECT STUDIO

A. **Objective**: Develop subjectively acceptable cigarettes with reduced sidestream visibility.

B. **Results**: Evaluation continued of the effect on cigarette parameters of additives to Kimberly-Clark's small particle size $CaCO_3$ paper. A low level of monoammonium phosphate (MAP) was incorporated in the new submission of papers in addition to 5% succinate and 0.3% carboxymethyl cellulose (CMC).

Sidestream visibility reductions ranged from 40 to 45% compared to Capri. There were no significant differences in mainstream deliveries between the new samples. The papers were also perforated and made into Trim models for internal subjective panel testing. Four models were selected: 1) the 5% succinate only paper, 2) 5% succinate with 0.3% CMC, 3) same as #2 with 0.5% MAP, 4) 5% succinate with 0.3% of a different grade of CMC and 0.5% MAP. All papers had been perforated at 20th Street to 50 Coresta. Tar deliveries for the cigarettes ranged from 6.3 to 7.1 mg, with puff counts of 8.1 to 8.6 puffs. Panel test results are expected the first week in July.

The Studio panel evaluated additional models with two different grades of CMC and found them to be noticeably different in taste. According to S. Baldwin, the two grades have different thermal characteristics, which could result in a slightly altered smoke chemistry. Additional papers with the new CMC but without MAP were requested and received from Kimberly-Clark. Perforated papers will be made into the Trim configuration as soon as a machine is available.

The Studio panel also evaluated slightly more porous versions of the special $CaCO_3$ paper (8 vs. 5 Coresta). They were found comparable to nonperforated versions of paper with the same additive combinations. The trade-off was seen in slightly lower mainstream deliveries and puff counts and a smaller sidestream visibility reduction (32% vs. 43% ave.). Evaluation of the physical characteristics such as ash appearance and streaking are under evaluation. The goal is to find a paper that is subjectively acceptable and the best in terms of hole formation around the charline.

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The level of potassium succinate in the special $CaCO_3$ paper has been analyzed by Analytical Research. Their numbers indicate some variation in levels for the production samples. The target specifications from Kimberly-Clark also have a wide range. The four production run batches of paper showed reasonable agreement between P.M. and K-C, as did some of the earlier special $CaCO_3$ papers coated in their lab from a first mill run. Three of the earlier papers were very different in succinate level from what was described to us by K-C. This could possibly explain some of the discrepancies in visibility that have occurred.

C. **Plans**: Continue investigation of chemical loading on the $CaCO_3$ paper, and development of reduced level $Mg(OH)_2$ wrappers.

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